

Hand-Held, One-Way Voice Translation System

Real-Time Language Translation Tools Assist Deployed Military Personnel and Law Enforcement



Technology and Innovation

After the events of 9/11 and the military's initiation of operations in Afghanistan, there was an immediate need for a small handheld device that would allow U.S. military personnel to communicate with local people in areas of deployment. Under the DARPA SBIR program, VoxTec International, then a division of Marine Acoustics, Inc., developed the Phraselator® handheld translation device and tools to meet this need.

Phraselator® translation devices provide on-the-spot translation of predetermined phrases from spoken English into other languages, enabling users to communicate with non-English speakers almost anywhere in the world to provide information, give directions, or ask questions with easily conveyed responses (like yes or no). VoxTec's current model, the Phraselator® P2, does not translate responses from other languages back into English, but its one-way language translation capability reduces communication barriers enough for troops to secure areas, maintain order, and build rapport with locals.

The user speaks into the P2 in English, and it matches the phrase to any of 41 currently available languages. Unlike many speech recognition devices, the P2 does not have to "learn" the speaker's voice or speech patterns in order to understand. It instantly understands anyone (male or female)



who speaks English, so a single device can be shared by multiple users. Use of Phraselator® technology multiplies a military force's ability to communicate with foreign-language populations and frees up human translators for more complex interactions. Repeated use also helps users learn new languages.

The device is designed for harsh field use. It can withstand rain and wind with fine sand, has successfully passed drop tests to 6 feet, and can still translate clearly and accurately into the language(s) needed for the mission. It features a large, day- and night-readable, color, liquid crystal display touch-screen; is both voice and touch screen activated to accommodate a variety of situations; and can output to a loud speaker.

The Phraselator® P2 handheld translation device provides fast phrase matching from English into other Languages



Phraselator® technology development team leader and retired Navy Seal Ace Sarich flying over Baghdad during a field testing and training visit

VoxTec's accompanying Module Builder™ Pro software allows users to build new language Modules on-site with additional phrases and languages for the deployed device with the help of local linguists.

Current military customers include U.S. Joint Forces Command (JFCOM), U.S. Special Operations Command (SOCOM), and the U.S. Marine Corps, with end users consisting primarily of deployed military personnel in Iraq, Afghanistan, and the Gulf region. With approximately 5,000 units in the field, the Phraselator® has been and is being used in many situations that require limited but direct communication with local populations. Here are some examples of current and past uses from phraselator.com.

- Marine Interdiction Operations—Ships use the Phraselator® P2 to communicate with other vessels and provide medical assistance at sea.
- Kosovo—The device was used by relief workers to provide refugee medical care and support to displaced persons.

- Afghanistan—Field medics providing medical assistance found the device very helpful. It allowed English-speaking female medics to provide medical assistance to female Afghans who would otherwise not have received treatment because modesty issues prevented the use of male interpreters. Phraselator® devices were also used for force protection, weapons searches, securing locations, and POW camp facility directives.

- Iraq—The Phraselator® P2 was used in basic military operations for force protection interaction. For example, the device was attached to loud speakers on Jeeps so that directions could be broadcast to villages as troops entered the area. It was also used to communicate with locals for weapons search and identification, medical assistance, check points, vehicle searches, assistance to displaced persons, detainment camp directives, camp perimeter security, and peacekeeping efforts.

- Southeast Asia—Military personnel sent to provide assistance in the aftermath of the December 2004 tsunami used Phraselator® P2 to give directions (safe drinking water instructions, evacuation, etc.); help reunite families; assist with sanitation efforts; distribute food, water, and clothing; and provide medical assistance.

The VoxTec International staff includes former military personnel who have the warfighters' needs in mind. The team, led by retired Navy Seals John Hall and Ace Sarich, works closely with various customer groups (including military sub-groups) to implement new capabilities and options. Having experienced personnel with military clearance on the team has aided tremendously in delivering the product into areas of military operation.

Outside of the military community, a number of law enforcement agencies have adopted the Phraselator® P2 as a tool to

communicate with citizens who speak little or no English. Emergency responders and health care professionals have also shown great interest in the device, resulting in several pilot programs and sales. The Australian military and police as well as British police have expressed an interest in the Phraselator® devices. Non-military applications include:

- Public safety—Conducting traffic stops, issuing detainment and booking directives, and managing inmates at correctional facilities
- Construction—Communicating safety regulations and work instructions to non-English-speaking employees
- Language learning and preservation—Facilitating language acquisition and recording dying languages for future generations
- Emergency/Medical—Communicating with patients, victims, perpetrators, and others at the scene who do not speak English

Here are some quotes attesting to the P2's value in the hands of our troops, law enforcement officials, and other users:

- U.S. Army: Special Forces Operations NCO, Current Operations NCOIC (Iraq)—“I was able to use the device to get exact information on a huge weapons cache and where unexploded ordinance was.... Best of all, as a Special Forces Soldier, I was able to use the device to build rapport with the people of Iraq.... This device was invaluable, and it assisted in protecting the team.”
- U.S. Marine Corps: II MEF Phraselator® P2 Assessment, GS15—When the CI/HUMINT units used the P2s in Iraq, the devices “performed extremely well! The P2’s vocabulary listing was used to supplement their [troops’] own knowledge of the Arabic language, and to offer options in language usage.”
- U.S. Navy: Naval Special Warfare Command, USS Enterprise—“The Phraselator® device allowed the patient to receive preliminary



Col. Jim Bass, former DARPA project manager using the Phraselator® in Afghanistan in 2002.

assistance until an Arabic speaker could be located. The effort, hailed as a minor but important gesture of cooperation and goodwill between the U.S. and the Iraqi people, received accolades from the Enterprise’s Commanding Officer and medical staff...”

- Lee County, FL, Sheriff's Office (excerpt from 11-18-05 press release)—“We anticipate the Phraselator® P2 will result in less use of force [in detention facilities].... If an inmate doesn’t understand you, the situation can escalate.”
- Thornton Media, Inc. (TMI), a Cherokee owned business (Don Thornton, President): “It is the most flexible and sophisticated language tool ever developed. Native-speaking elders laugh with delight when they hear the P2 speaking their language. Several have even cried. It’s humbling.”
- Construction—in 2005 in Hagerstown, Maryland, a painter fell while painting a window about ten feet above the ground. The construction manager happened to be nearby and responded to the scene. The painter could not speak English, so the construction manager used his Phraselator® P2 to give concise emergency instructions to the victim, to get the victim’s name and company, to ask witnesses if they had seen

VoxTec International, Inc. (Formerly a division of Marine Acoustics)

what happened, and to record a witness statement for later transcription. Referring to the incident, Gregory Ricker, Hagerstown, MD, Director of Safety and Water Intrusion for K. Hovnanian® family of homebuilders remarked, "The Phraselator® P2 is helping us bridge the communication gap and keep workers safe. It was priceless in this particular emergency and contributed to getting the worker immediate medical attention."

Joint Collaborations

VoxTec has collaborated within the SBIR and STTR programs and various military and other government agencies to develop training and determine desired product features and unique

Electronics provided the circuit boards. For selling the end product, VoxTec works with a variety of resellers including ADS and Aardvark Tactical, Inc.

Lessons Learned

- Find a customer willing to pay for a practical technology that can be developed and fielded. As fielded prototypes generate positive results, interest in the product will grow.
- Be prepared for a learning curve about who the end users of the technologies will be, and what other tools are available for their use.
- Develop a clear commitment and direction within the company to move beyond research and into developing and implementing products.
- To work effectively, be prepared to learn and understand government accounting, invoicing and auditing practices.

Economic Impact

The DARPA SBIR has enabled VoxTec to make major advancements in speech-to-speech technology research and development. The company's DARPA SBIR contracts (originated with former parent company, Marine Acoustics) have resulted in nearly \$7 million in revenues. Continued support from SBIRs has contributed to the company's ability to conduct ongoing research and development efforts, which help the company put even better tools into the hands of warfighters and increase its profitability.

VoxTec International, Inc. initially spun out from Marine Acoustics in 2004 to manage the manufacturing, sales and distribution of Phraselator® handheld translation products. In June of 2006, VoxTec International acquired all intellectual property, including licensing rights and patents associated with Phraselator® translation technology. In addition to the design patent VoxTec holds, it has applied for a utility patent.



The complete Phraselator® P2 kit

user requirements. During Phraselator® prototype development, VoxTec worked with Applied Data Systems for circuit boards, SRI International for application software development, and Montalbano for industrial design. For the current P2, Helix Design provided hardware design and InHand

About the Company

VoxTec International Inc., a Delaware Corp. based in Annapolis, MD has successfully fielded three generations of Phraselator® handheld translation devices since 2002. In addition to manufacturing, selling and improving in its existing products, VoxTec pursues research and development across the spectrum of machine based language translation technologies and is involved in programs such as DARPA TransTac. The Phraselator® P2 is in use by all branches of the military, as well as in civilian law enforcement and limited construction and health care settings. In early 2007, VoxTec introduced a new line of wearable, hands-free, eyes-free translation products. ■



Ace Sarch of VoxTec, shown here in Afghanistan with a Marine end user, works closely with customers to implement new capabilities and options

Company Information

VoxTec International
20 Ridgely Ave., Ste 301
Annapolis, MD 21401
Phone: 410-626-1110
Fax: 410-626-1112
www.voxtec.com

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